

## **SECTION 110 – ELECTRICAL**

### **1. CODES, PERMITS AND INSPECTION**

A. Wiring in accordance with latest edition of National Electrical Code (NEC) and / or applicable local, state and utility company rules, laws and ordinances.

B. Secure all permits and inspections required for installation of electrical work.

### **2. VERIFICATIONS**

A. Verify mounting heights, locations of electrical equipment prior to rough-in. Verify sizing, loading of equipment to be installed.

B. Verify exact location of electrical service entrance, including point of service, system characteristics.

C. Verify all equipment for compatibility for service.

### **3. WIRING METHODS**

A. All materials shall be new, carry Underwriter's Label or be "listed" by that group and be fully equal to makes specified.

B. Use only insulated copper conductors in conduit. Use flexible conduit for connections to motors, transformers, similar equipment.

C. All wiring concealed, except as noted otherwise.

### **4. TESTS**

A. The contractor shall be responsible for performing all tests necessary to prevent concealment of defective or improper work.

B. Upon completion of work, test installation thoroughly and render it free from shorts, grounds or improper connections.

### **5. GUARANTEE**

The Contractor shall guarantee that all defective items of workmanship, materials, labor or mechanical operation developing within one (1) year from date of final acceptance of completed installation shall be replaced to the complete satisfaction of the Owner.

6. WORKMANSHIP

A. Electrical equipment shall be installed in neat, workmanlike manner. Unsightly installations shall be removed or reworked by Contractor at no additional expense to the Owner.

7. SERVICES

A. The Contractor shall pay for all expenses, deposits, reimbursements, etc. required by the local rules and codes for the service, complete and ready for use.

B. He shall bear all expense involved for the complete installation of the electrical service ready for operation, except as specifically excluded on the plans.

C. He shall consult all local departments to verify requirements and bid installation of service in accordance with local codes.

8. MAIN SERVICE

A. 120/240 volt, single phase, three wire, system for main power.

9. CONDUITS

A. Rigid conduit shall be standard size, hot dip galvanized conduit.

B. Thin wall tubing shall be Electrune Steel Tubes with Thomas and Betts compression type fittings. Die cast fittings shall not be used. Thin wall conduit may be used where code permits except as outlined above.

C. All conduit installed in concrete, and all conduit 1- 1/4" and larger shall be rigid conduit.

D. Plastic conduit shall be U.L. listed P.V.C. Schedule 40. Plastic conduit shall be used where feeders are to be run in earth. Use conduit adapters when converting from plastic to steel conduit.

10. CONDUCTORS

A. Conductors shall be copper, generally, with 600 volt rated insulations. Branch circuit wiring minimum size #12 type "TW" or as required. Service entrance, feeder conductors combination type "THW". Low voltage wire type "TF" or "TFF" in #18 guage unless noted otherwise. All other special types shall be as required by NEC.

B. All conductor color coded with type and size marking. All connections to service equipment, feeder panels shall be made with solderless lugs. All splices, taps, connections to service entrance conductors shall be made by bronze solderless lugs. All other splices, connections shall be soldered or pressure type connectors where permitted by code.

C. Insulate joints, splices with plastic tape or plastic molded jackets.

11. OUTLET BOXES AND WALL RECEPTACLES

A. Outlet boxes shall be galvanized steel of type and size approved for particular installation requirements.

B. Duplex receptacles ivory Bakelite, "Specification Grade", back or side wired, grounding type, 20A, as indicated, Sierra No. 1460 or equal.

C. All boxes and receptacles firmly secured to building construction.

D. Surface wiring devices shall be covered with suitable heavy steel covers with rounded edges and corners.

12. BRANCH CIRCUIT PANELS

A. Branch circuit panels equal to General Electric, I.T.E., Square D, Federal or Westinghouse, with thermal magnetic breakers.

B. Breakers shall have individual plastic cases sized as scheduled. Two pole breakers shall be common trip (single pole units with tie bars are not acceptable).

C. Panel shall be recessed, hinged door with neatly typed circuit directory card.

D. Panel Circuiting: Reassign circuits to properly balance the loads on the phases if final connections and tests show it to be advisable.

13. WIRING FOR MECHANICAL EQUIPMENT

A. Install service and connect pumps and controls.

14. GROUNDING

A. Provide system ground as required by NEC and utility company.

B. Bond mechanical equipment frames.

C. Bond all service entrance equipment and conduit system.